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REMARKS ON
FERMENTATIVE DYSPEPSIA

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There are few diseases that present greater difficulties in the way of treatment and of permanent cure than what may be termed functional dyspepsia. In using the term functional dyspepsia I wish to be understood as meaning difficulty in digestion unconnected with ascertainable lesions of the digestive organs or of the alimentary tract, and not complicated with serious organic disease of other parts. While certain alterations may exist in the digestive organs, they are temporary, at least when the disease is not of long standing, and they must disappear in cases of permanent relief. Almost all cases of dyspepsia of long standing are accompanied with more or less mental and moral disturbance, even though the periods of pain or discomfort may not be very long. These nervous symptoms I do not propose to describe. They are protean in their character and manifestations, often relieved or mitigated by moral influences, such as change of scene or occupation, without much actual improvement in digestion. They almost invariably disappear as the normal digestive processes are restored. The long standing "peripatetic" cases, with which physicians are unhappily too familiar, have been prominent among the unsatisfactory and discouraging experiences in general practice. Such cases usually are treated with but little expectation of permanent relief, and the most satisfactory result usually to be expected has been temporary improvement by means of palliatives, and a life rendered more or less miserable by a real or fancied necessity of constant attention to diet and general hygiene. It is in precisely such cases as these—unconnected with gross excesses or indiscretions in diet, and especially with the abuse of alcoholic beverages or narcotics—that modern medicinal therapeutics seems likely to produce such results as will render the treatment of fermentative dyspepsia of a purely functional character almost as certain and satisfactory as that of any acute trivial disorder.

Flatulence is a very common attendant of functional dyspepsia. This condition may be more or less pronounced, and there are great variations in the degree to which it is tolerated by different individuals. The discomfort and distress which accompany flatulence may amount to actual pain, which is sometimes, though rarely, intense; but when pain is habitual,

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remedies directed to its prompt relief are merely palliative and usually do actual harm in the end. This remark is especially applicable to all forms of opiates, whether administered by the mouth or by subcutaneous injection. Contrary to the popular and, to a certain extent, the professional notion, I must apply this remark as well to the various pepsins, pancreatins *et id genus omne*, so commonly prescribed. I have fairly full records and histories of a score or more of what may be called peripatetic cases of dyspepsia of several years' standing which have been subjected to nearly every variety of routine treatment, and these constitute but a small proportion of the cases that have come under my observation. I have yet to see, however, a single case in which any of the pepsins, pancreatins, or the physiologically absurd combinations of pepsin and pancreatin logically seemed to have produced any benefit, even of a temporary character. In certain cases in which they have appeared to act favorably as palliatives, careful inquiry has almost invariably shown an attention to diet and hygiene during their administration to which their apparently favorable effects have been fairly attributable. If this statement is even in a measure correct, it is most important that the fact should be recognized and appreciated, in view of the gratuitous instruction in the physiology of digestion and the pathology and therapeutics of dyspepsia offered so freely to physicians in the advertising pages of medical journals and in circulars by pharmaceutical manufacturers and even meat packers, and indiscreetly indorsed by members of the profession. Of late years my opinions have not permitted me to extend my experience in pepsins, etc.; but the histories of previous treatment in cases that have come under my observation, as well as physiological considerations, have convinced me that agents intended to supply an assumed deficiency of digestive enzymes are absolutely inert. I do not wish, however, to be understood as including in this condemnation the use of foods partially digested, or peptonized, undoubtedly valuable in many cases.

This subject, to my mind, is so important that it seems proper to give my reasons for the decided opinion just expressed :

Digestion is one of the most complex of the physiological processes, and even now it is but imperfectly understood. Concerning certain facts, however, there can be no doubt. It is well known to physiologists that a combined as well as a successive action of the digestive fluids is essential to normal digestion. If the food is imperfectly masticated and insalivated, especially the latter, digestion becomes difficult. It is essential not only that the saliva should exert its own chemical and mechanical action, but that it should become gradually mixed with the secretions of the stomach, and that the gastric juice should as gradually be mixed with the food, the pepsinogen being transformed as it is discharged from the peptic cells into pepsin by the action of the hydrochloric acid produced by its peculiar cells. Assuming, even, that a few grains of what is called pepsin, extracted from a pig's stomach and dried, will have the same action in the human stomach that it has on minced food in a test tube, it is by no means certain that the discomfort and distress which are sometimes observed soon after

taking food are due to deficiency of pepsin. As a rule, these symptoms are produced by the undue formation of gases, which artificial pepsin is not known to have any power to control. Normally the gases of the stomach do not exist in large quantity, and probably are derived mainly from the air which is incorporated with the food in mastication, an evidence of which is the presence of a considerable portion of oxygen, which is not found in other portions of the alimentary tract. When gas is formed in the stomach, it is probably due to the action of micro-organisms, and these organized ferments take no part in digestion.

It is almost inconceivable that artificially extracted digestive enzymes can find their way into the small intestine in such a condition as to exert any action in digestion. The so-called pancreatin has no existence, the enzymes produced by the pancreas being trypsin, amyllopsin, and steapsin. Intestinal digestion, also, is an alkaline process; and it has been abundantly shown by experiment that it can not go on with sufficient efficiency to support life in the absence of the action of the intestinal juice, the composition of which is unknown, and of the bile, the action of which has never been clearly understood and defined. Life, indeed, cannot be maintained in the absence of either the bile or the intestinal juice alone.

Gases are much more abundant in the small intestine than in the stomach; and a certain quantity of gas is essential to the proper movements of the alimentary mass under intestinal peristaltic action. The composition of the gas in the small intestine—consisting, as it does, of carbon dioxide, pure hydrogen, and nitrogen in variable proportions—shows that it is in its greatest part derived from the food, even if it be admitted that a certain proportion of the carbon dioxide may be evolved from the blood. When gases are produced in excessive quantity in the small intestine, the action of micro-organisms is probably involved. It is not pretended that the so-called pancreatin has any influence in modifying or restraining this action.

In cases of functional dyspepsia it is by no means invariable that the body is badly nourished, unless the diet is greatly restricted. Many dyspeptics have an appearance of perfect health. While digestion may be slow, labored, and attended with great discomfort and even actual pain, the processes may be efficient and complete, and general nutrition may be perfect. Although such cases are exceptional, they are not uncommon. It is seldom observed, however, that a strict diet called, perhaps, antidyspeptic secures immunity against dyspepsia, although it is desirable and useful to avoid notoriously indigestible articles and those which, in individual cases, have been found to occasion distress.

In my opinion it is seldom the case that undue fermentation in the alimentary mass begins in the intestinal canal. It usually occurs first in the stomach and is continued in the small intestine. In the exceptional cases in which its origin is intestinal there is usually a deficiency of bile, and more or less active diarrhoea is present. In the great majority of cases, however, constipation is fully as common as diarrhoea, and sometimes the bowels are regular. When there is no gastric flatulence, when

the digestive discomfort begins two or three hours after the taking of food, and when diarrhoea with flatus is present, it is probable that the fermentation is purely intestinal and that it continues to an abnormal degree after the residue of food has passed into the large intestine. In all cases it is important to regulate the action of the bowels, either by laxatives or by agents that have the opposite effect. I have been lately in the habit of using Villacabras water as a laxative when constipation is obstinate. By carefully regulating the dose of this water according to the effects observed in individual cases, I have found it act most satisfactorily. Using it for any considerable time, the dose, as well as the frequency of its administration, may be diminished rather than increased, and the dejections are usually easy and painless. I give before breakfast enough to produce two or three evacuations; and for two or three days after a daily movement follows. It may then be repeated if necessary and given as required. A very important point in the treatment of dyspepsia with constipation is to see that the patient acquires the habit of soliciting, without great effort, a movement of the bowels every morning at a fixed hour, resisting a desire for defecation at other times. Attention to this will sometimes regulate the bowels without the use of laxatives. In cases of undue looseness of the bowels, the remedies administered with the object of restricting fermentation will often suffice. Opium or its derivatives should never be used unless imperatively demanded by intense pain.

My object in writing this paper is to call attention to the value of certain modern additions to the materia medica that act as antifermentatives. For many years the late Dr. Austin Flint was in the habit of using salicin in doses of about ten grains before each meal, often with remarkable success. I have used this remedy very largely and have frequently found it of great benefit; but I have lately employed other agents which seem to be much more efficient.

In nearly every case of functional dyspepsia that has come under my observation within the last ten months, I have begun the treatment by giving five grains of bismuth subgallate, either before or after each meal. In some cases it seems to act more favorably when given before meals, and in others its action is better if taken after eating. In studying my records and memoranda of cases, I find that the treatment by salicin has often been unsatisfactory. The proportion of unsuccessful cases was about twenty-five per cent; but in some cases the effects of this remedy given alone have been remarkable. I have full records of one case of severe dyspepsia of ten years' standing that was completely relieved in a week without any return, now for more than a year. The bismuth subgallate, however, is almost a specific in cases of purely functional dyspepsia with flatulence. While I have full records of a few obstinate cases, the histories of most are merely short memoranda, and of many I have no records. Since December 8, 1892, when I began to use the bismuth subgallate, I have noted only two cases in which it gave no relief, there being no evidence of organic disease. Both of these were in hysterical women. In both I used salicin and salol; and in one, salol, salicin, naphthalin

and aristol. These were cases of long standing which had resisted treatment of every kind, and they soon passed from under my observation.

I was led to use bismuth subgallate by seeing it recommended as a valuable remedy in the diarrhoea of children, acting as a disinfectant. I first employed it in a case of dyspepsia of eleven years' standing which is so remarkable in some of its characters that I shall give, farther on, an account of it somewhat in detail. Its action in this case was so favorable that I began to prescribe it very largely, almost invariably with remarkably satisfactory results, and I continue to use it almost daily. I have no records of many of my cases, but have been careful to note the few instances in which I have been disappointed in its effects, with certain cases in which its favorable action has been truly remarkable. I have already mentioned the two cases in which it seemed to be of no benefit. The following are a few of the cases of remarkably prompt and favorable action. A case of alcoholism of twenty years' standing, with habitual dyspepsia for the last five or six years; bismuth subgallate gave almost instant relief; the flatulence and distress disappeared in twenty-four hours, and did not return, except in a very mild degree, when they were usually relieved by a single dose. While under other treatment for alcoholism, this condition was relieved. The patient has taken no alcohol for several weeks and has no craving for it. A case of dyspepsia of four years' standing, with a chronic diarrhoea, was entirely relieved in five days by the use of the bismuth subgallate alone. A case of dyspepsia of more than thirty years' standing was promptly relieved by bismuth subgallate alone. In this case, every few weeks the trouble returns and is relieved by two or three doses. I am indeed no longer surprised at results from the use of this remedy which first seemed to me remarkable; and now I confidently expect prompt and favorable action. I have been in the habit of prescribing it in capsules containing five grains each, but lately have had it prepared in the form of tablets. In this latter form it is more convenient and seems to act more favorably.

The following case, which I give on account of certain remarkable and interesting features, is the first in which I used bismuth subgallate.

On November 16, 1892, a gentleman, about forty years of age, tall and robust, with the appearance of perfect health, consulted me in regard to a long-standing dyspepsia. He had suffered from indigestion with considerable pain for a long time, and about eleven years ago, under the advice of a physician, had adopted an exclusively milk diet. Since that time he has taken milk and nothing else, consuming about five quarts in the twenty-four hours. He had been in the habit of taking milk about every half hour during the day and at variable intervals at night. If he goes more than an hour during the day without milk he has gastric and intestinal pain which soon becomes almost unbearable, but is soon relieved by about half a pint. With the pain he has great flatulence and violent eructations. During the past eleven years he has engaged in literary work and has travelled extensively in this country and abroad. While taking milk, however, he has felt well, slept well, taken considerable

exercise, and his bowels have been regular. His personal and family history is good in every respect, and a careful physical examination failed to reveal structural disease of any organ. He wished to be treated for what he called the "milk habit."

I directed him to cut off milk promptly and absolutely, and to take three meals a day without restriction as to quantity or kind of food, except that he was to avoid sweets and pastry and be moderate in the use of wine at dinner. I prescribed ten grains of salicin four or five times daily, and always to take a dose after eating. On the evening of the first day of treatment he went to a dinner party, eating and drinking of everything. He described his sensations at the dinner as most delightful, enjoying his unaccustomed food immensely; but his teeth were sore and his jaws tired after eating, as he had not masticated for eleven years.

On the following day he reported that he had suffered intensely with abdominal pain and eructations, but nevertheless had taken breakfast, lunch and dinner, and had abstained from milk. I continued the treatment and directed him in addition to take sodium carbonate five or six times daily to relieve the flatulence.

On the third day he reported that he was doing fairly well, but still suffered considerably an hour or two after eating.

On the fourth day he was about the same. I discontinued the salicin and prescribed naphthalin, five grains every four hours. During the entire treatment he took sodium bicarbonate freely and as often as he felt much discomfort from flatulence.

On the fifth day, having eaten like other persons from the beginning of treatment, taking no milk, he had slightly improved. He thought the naphthalin gave him considerable relief.

On the sixth day he was doing very well, and the treatment was continued. He had become so much encouraged that on the fifth and sixth days he took supper late at night, with some excess in eating and drinking.

On the seventh day he was not so well. The indiscretions in diet of the fifth and sixth days, as he thought, gave rise to considerable pain with flatulence and vomiting. At night on the sixth day he took about half a pint of milk, which gave great relief. I discontinued naphthalin, substituting five grains of salol every two to four hours, and allowed a glass of milk at night.

On the tenth day he reported that he had done fairly well. The treatment was continued with the addition of a glass of milk on rising in the morning.

On the twelfth day he had improved, the salol acting well. The treatment was continued.

On the fourteenth day he reported as not so well, having had a great deal of flatulence. I continued salol and prescribed ten grains of salicin before eating.

On the sixteenth day he was about the same. I prescribed a teaspoonful of listerine after eating.

On the twentieth day he reported no progress. The listerine seemed

to have no effect. I discontinued listerine and prescribed ten grains of menthol as required.

On the twenty-third day he reported that the menthol seemed to act unfavorably. I then discontinued other remedies and prescribed ten grains of bismuth subgallate three times daily after eating. On the following day he went to Washington for six days.

On his return from Washington—the thirtieth day—he reported that his diet had been unrestricted and that he had been perfectly well since first taking bismuth subgallate. From time to time he took, in addition to the bismuth subgallate, sodium bicarbonate to relieve slight flatulence with eructations. He then left the city for an extended journey abroad.

In May, 1893, six months after, I received a friendly letter from the patient, in which he made no mention of any digestive disturbance.

In August, 1893, the patient called upon me and reported that he had travelled extensively, at times subjected to very unfavorable conditions of diet; that he had been perfectly well and strong; had lost some flesh, which he regarded with satisfaction; had taken very little sodium bicarbonate, and occasionally, though rarely, a few doses of bismuth subgallate. His diet was unrestricted, and he considered himself permanently cured.

I have given rather an extended account of this case to illustrate the unsatisfactory results following the administration of a great variety of antifermentative remedies until the bismuth subgallate was prescribed. This remedy promptly produced marked improvement, and in the light of my subsequent experience, it seems to me that if it had been used earlier the recovery would have been much more speedy.

It was not my intention to discuss the question of diet in the causation and treatment of fermentative dyspepsia. Of course, a cure is established only when a diet practically unrestricted may be used with impunity. During the treatment of these cases patients are simply directed to avoid excesses in food and drink and to eat little or no pastry or sweets.

We are prepared to furnish Bismuth Subgallate, in Compressed Tablets of Five Grains each.

JOHN WYETH & BROTHER,

Manufacturing Chemists,

PHILADELPHIA.